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WATER SUPPLY OUTLOOK FOR WASHINGTON



U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

JUNE 1, 1975

Data included in this report were obtained by the agencies named above in cooperation with Federal, State and private organizations listed inside the back cover of this report.

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Cover Photo: Cabins near Sacajawea Snow Course in Bridger Mountains, Montana.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 111, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS	
Alaska	204 E. 5th. Ave., Room 217, Anchorage, Alaska 99501	
Arizona	6029 Federal Building, Phoenix, Arizona 85025	
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217	
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702	
Montana	P.O. Box 98, Bozeman, Montana 59715	
Nevada	P. O. Box 4850, Reno Nevada 89505	
Oregon	1218 S. W. Washington St., Portland, Oregon 97205	
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 841	38 .
Washington	360 U.S. Court House, Spokane, Washington 99201	
Wyoming	P. O. Box 2440, Casper, Wyoming 82601	

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia

WATER SUPPLY OUTLOOK FOR WASHINGTON

and FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

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WATER SUPPLY OUTLOOK State of Washington June 1, 1975

Mother Nature has been favorable to the water supply outlook for the * state of Washington. The few snow courses that are measured in the * * state continue to indicate well above normal snow packs, but not as * * great as was measured last year at this time. Rainfall was below * * normal throughout most of the state, with the exception of the * * central area, during the month and accumulated spring rainfall was * * below normal except in the north central area. Temperatures have * * been cool this past month which has markedly reduced runoff from most * * watersheds. Only those watersheds with most of their drainage in the * * lower elevation zones produced above normal runoff during the month. * * An additional plus to this cool weather will be the reduction of the * * forecasted flood stages. Above normal water will be extended thru * * June and July, but the stages should not be as great as previously * * anticipated. June 1 reservoir storages mean very little, as most are * * being controlled for flood control purposes.

SNOW COVER

Only a few high elevation snow courses are measured on June 1 in the state of Washington, but many more are measured in the tributary basins in British Columbia, Montana and Idaho. All snow courses indicate less water than was measured last year, well above that which was measured in 1973 and generally above average. As always, there are a few exceptions. Comparison of snow courses, as we have done in the past several months, is not a good indicator this late in the season. It would work out for those snow courses at the very high elevations, but at the mid and lower elevations the snow pack fluctuates too greatly around zero and is not indicative of current conditions.

RESERVOIRS

All reservoirs are being managed for flood control purposes. Some with limited outflow, such as Coeur d'Alene Lake, have well above normal amounts of water in storage and even well above capacity. Pure irrigation reservoirs, such as Banks, Salmon and Conconully Reservoirs, have above normal amounts of water in storage and are full or nearly so. Power reservoirs, such as Franklin D. Roosevelt and Lake Chelan, are low but will fill with the spring runoff. The five Yakima Reservoirs have been drafted during these past months, but are now going on storage and will fill by June 15th or 20th.

STREAMFLOW

The streams that were reported to have above normal outflow during May are the ones draining the lower elevations, such as Spokane, Klickitat, Palouse, Walla Walla, Chehalis and Green. Other streams were reported to have less than normal outflows and the Columbia, flowing from the north, had an outflow that was 79 percent of normal at Birchbank, but increased to 97 percent at The Dalles.

PRECIPITATION

Rainfall was generally below normal with only north central and central Washington reporting above average precipitation. The northwest slopes of the Cascades had normal rainfall, while the rest of Washington varied from 14 percent below normal to 5 percent below. In Canada, the Columbia Drainage precipitation was 29 percent below average. These are preliminary figures, as released by the National Weather Service.

RESERVOIR STORAGE - 1000 Acre Feet USABLE 1/ Measured June 1. BASIN OR 1975 CAPACITY 1973 RESERVOIR 1975 1974 STREAM Normal* COLUMBIA Coeur d'Alene Lake 218.9 225.1 326.8 397.7 299.8 Spokane Columbia Franklin D. Roosevelt 5232.0 600.2 Lake 979.0 1808.5 3239.1 Banks Lake 761.8 507.5 204.9 112.2 446.7 Columbia 10.4 10.4 Okanogan Conconully Reservoir 13.0 12.1 11.5 10.5 10.1 9.3 Okanogan Salmon Lake 10.5 10.5 676.1 481.4 Lake Chelan 339.5 390.0 436.7 Chelan YAKIMA 147.5 Keechelus Lake 157.8 129.4 114.1 122.9 Yakima 226.2 Kachess Lake 196.8 173.1 239.0 191.9 Kachess 336.4 301.5 337.2 387.3 Cle Elum Lake Cle Elum 436.9 16.6 27.8 27.7 Bumping Lake 33.7 16.9 Bumping Rimrock Lake 148.4 131.8 172.0 198.0 142.7 Tieton PUGET SOUND 736.8 808.8 1056.3 708.6 1404.1 Ross Reservoir Skagit 86.8 87.9 84.8 88.8 Diablo Reservoir 90.6 Skagit

Skagit

Gorge Reservoir

9.8

9.0

8.9

8.1

 $[\]underline{1}$ / Based on Active Storage

^{* 15-}year Average 1958-72

 $\begin{array}{c} \text{PRECIPITATION } \underline{1}/\\ \\ \text{Division Averages and Departures} \end{array}$

	FALL		WII	NTER	SPRING		
Drainage	Sept-Oct	1974 <u>2</u> /	Nov1974	Mar1975	April-M	ay 1975 2/	
Divisions	Observed	Departure	Observed	Departure	Observed	Departure	
Columbia in Canada	1.22	- 3.25	13.42	+ 0.67	1.75	- 1.48	
Pend Oreille - Spokane	0.71	- 3.77	21.69	+ 2.99	3.91	- 0.50	
Northeastern Washington	0.30	- 2.48	14.78	+ 3.67	2.95	- 0.31	
Southeastern Washington	0.31	- 2.92	15.27	+ 1.80	3.14	- 0.52	
Central Washington	1.21	- 3.54	31.75	+ 4.22	2.61	- 0.70	
North Central Washington	0.37	- 1.25	7.93	+ 1.21	2.50	+ 0.61	
Northwest Slope Cascades	3.25	- 9.44	59.41	+ 7.18	8.19	- 1.93	
Southwest Slope Cascades	2.49	- 6.19	44.71	+ 3.07	5.28	- 2.02	

Northeastern Washington

Southeastern Washington

Central Washington

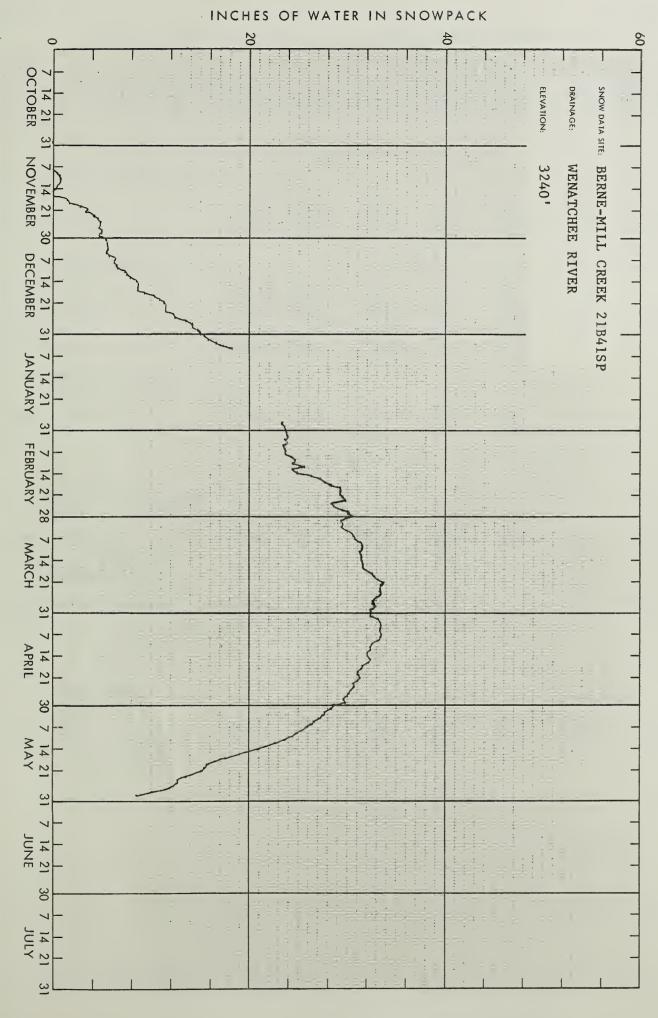
North Central Washington

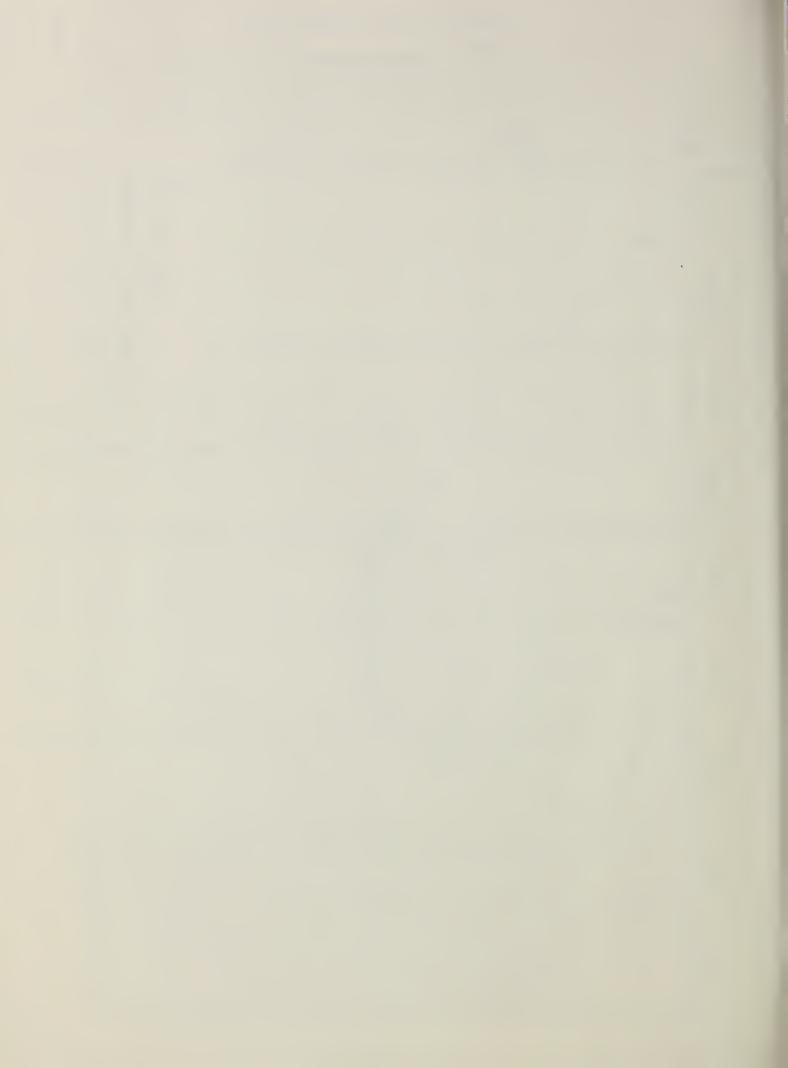
Northwest Slope Cascades

Southwest Slope Cascades

- Lower Spokane, Colville, Sanpoil and Lower Kettle Drainages.
- Touchet, Tucannon and Palouse Drainages.
- Yakima, Wenatchee and Chelan Drainages.
- Methow and Okanogan Drainages.
- Puget Sound Drainages.
- Lower Columbia Drainages.
- 1/ Preliminary analysis by National Weather Service from data furnished by Meteorlogical Services of Canada and the National Weather Service.
- 2/ Departure from 15-year (1958-72) drainage division average.







CORRECTIONS AND ADDITIONS - 1975 SNOW REPORTS - APPENDIX 1

SNOW				THIS YEAR	<u> </u>	PAST R	ECORD
DRAINAGE BASIN and/or S	NOW COURSE		Date	Snow Depth	Water Content	Water Conte	ent (inches)
NAME	Number	Elevation	of Survey	(Inches)	(Inches)	Last Year	Average #
		Febru	ary 1		·		
COWLITZ RIVER							
Pigtail Peak	21C33	5900	1/28	135	49.5	60.5	46.7
Potato Hill	21C14	4500	1/28	78	$\frac{49.5}{26.3}$	34.6	23.7
GREEN RIVER							
Cougar Mountain SP	21B42SP	3200	1/3	34	8.4	15.2	-
Lester Creek	21B29	3100	11/25	$\frac{34}{12}$	$\frac{8.4}{3.2}$	9.1	3.4
Lynn Lake	21B50	4000	11/25	0.8	0.3	10.4	-
Snowshoe Butte SP	21B43SP	5000	12/18	54	22.6	•	-
SKOKOMISH RIVER							
Home Sweet Home	23B05	5200	1/27	118	45.2	69.0	56.5
		Apri	1 1				
PEND OREILLE RIVE	<u>er</u>						
Lookout	15B02	5250	3/14	100	36.5	48.2	35.6
BAKER RIVER							
Schreibers Meadow +	21A10A	3400	3/29	176	71.4	104.2	65.6
	`	May	1				
BAKER RIVER							
Dock Butte +	21A11A	3800	4/29	176	78.8	106.8	77.4
Schreibers Meadow +	21A10A	3400	4/29	160	73.8	100.4	67.5

[#] Average based on 1958-72 average

⁺ Snow water equivalent estimated from aerial stadia observation

SNOW DATA TO JUNE 1, 1975 - APPENDIX 2

SNOW				THIS YEAR		PAST R	ECORD
DRAINAGE BASIN and/or S	NOW COURSE		Date	Snow Depth	Water Content	Water Conte	ent (inches)
NAME	Number	Elevation	of Survey	(Inches)	. (Inches)	Last Year	Average #
			L.,,	· · · · · · · · · · · · · · · · · · ·		L	L.,

UPPER COLUMBIA DRAINAGE

0 1	F E K C	О 11 0 Г	1 11 1 17	DIAI	NAGL		
PEND OREILLE RIVE	<u>R</u>						
Baree Creek	15B11	5500	5/15	104	55.6	65.4	42.6
Baree Midway	15B16	4600	5/16	73	38.4	43.2	24.5
Baree Trail	15B15	3800	5/16	0	0.0	0.0	0.0
Heart Lake Trail	14C10	4800	5/15	50	23.1	24.6	10.2
			5/30	30	14.4	11.9	1.7
Hoodoo Basin	15C10	6000	5/15	119	57.6	76.2	48.8
			5/30	101	51.2	62.6	34.9
Hoodoo Creek	15C01	5900	5/15	112	54.8	72.3	45.5
	23 - 0 - 2		5/30	95	47.6	63.6	33.5
Lookout	15B02	5250	5/15	80	41.0	-	30.9
Bookode	13202	32 30	5/30	54	28.8	34.2	-
Nelson	19 - Can	3050	5/13	12	5.2	2.9	0.8*
Netson	1)-Can	3030	5/29	0	0.0	0.0	0.0*
			3/29	U	0.0	0.0	0.0
KETTLE RIVER							
Big White Mtn.	154 - Can	5500	5/14	50	24.2	28.8	17.8 *
			5/29	34	18.4	25.9	8.8 *
Carmi	126 - Can	4100	5/14	0	0.0	0.0	0.0 *
Farron # 1	17 - Can	4000	5/15	14	5.4	6.5	- *
Farron # 2	243 - Can	4000	5/15	16	6.8	-	- *
Graystoke Lake	5-Can	5950	5/14	45	19.1	29.2	21.1 *
Monashee Pass	48A-Can	4500	5/14	19	8.9	12.1	9.4 *
			6/1	3	1.5	7.5	2.0 *
Old Glory Mtn.	42 - Can	7000	5/11	88	39.2	48.1	29.1 *
·			5/30	60	30.8	46.1	17.3 *
Trapping Creek Upper	165 - Can	4450	5/14	0	0.0	1.4	0.5 *
SPOKANE RIVER							
Granite Peak	15B13A	6000	5/29	99	42.1	45.0	
Lookout	15B02	5250	5/15	80	41.0	-	30.9
Lookode	1,002	3230	5/30	54	28.8	34.2	50.7
Lost Lake	15B14A	6000	5/29	125	58.2	83.6	_
Medicine Ridge	15B04A		5/29	100	43.4	52.6	-
medicine kidge	130048	0130	3/29	100	45.4	32.0	_
OKANOGAN RIVER							
Blackwall Peak	100 - Can	6250	5/13	79	37.1	51.2	37.6 *
			6/2	50	26.5	49.2	29.1 *
Brenda Mine	193 - Can	4800	5/14	7	3.1	5.1	2.9 *
			5/26	0	0.0	0.0	0.0 *
			-,		- •		

[#] Average based on 1958-72 average

^{*} Average for years of record

NOW			THIS YEAR	Y	PAST RECORD		
DRAINAGE BASIN and/or SI	NOW COURSE		Date	Snow Depth	pth Water Content	Water Content (inches)	
NAME	Number	Number Elevation	of Survey	(inches)	(inches)	Last Year	Average #
OKANOGAN RIVER (C	ont.)						
Brookmere	27-Can	3200	5/15	13	5.0	0.6	2.9
Enderby	130-Can	6250	5/14 5/30	98 91	43.3 42.1	59.0 56.0	45.2 40.0
Esperon Creek Lower	164 - Can	4400	5/14 5/31	13	5.6 0.0	7.5 2.4	2.5
Esperon Creek Middle	163 - Can	4700	5/14 5/31	23	11.1	13.2	4.9
Esperon Creek Upper	162 - Can	5400	5/14 5/31	44 27	22.2 14.0	24.6 19.3	9.8 5.9
Graystoke Lake	5-Can	5950	5/14	45	19.1	29.2	21.1
Hamilton Hill	107-Can	4900	5/13	23	10.3	10.7	6.5
Isintok Lake	152-Can	5510	5/11 5/29	21 4	7.8 1.5	10.2	4.8
Lost Horse Mountain	105 - Can	6300	5/16 5/30	27 16	9.6	15.6	10.3
McCulloch	4-Can	4200	5/14	0	0.0	0.2	0.6
Missezula Mountain	106-Can	5100	5/14	16	6.4	7.2	1.9
Mission Creek	5A-Can	6000	5/14	51	21.3	30.9	19.1
ission creek	JA-0an	0000	5/29	41	20.0	29.4	11.4
Monashee Pass	48A-Can	4500	5/14	19	8.9	12.1	9.4
Tollastice 1 ass	4011- 0 411	4300	6/1	3	1.5	7.5	2.0
Mount Kobau	156-Can	5950	5/14	38	14.1	20.2	10.0
Hount Robau	150-0411	3730	5/30	21	8.3	19.2	2.0
New Penticton Res. # 2	183-Can	5225	5/15	24	8.5	10.0	7.3
new reflection neo; " 2	203 041.	33	5/31	4	1.4	6.1	-
Silver Star Mountain	99 - Can	6050	5/12	65	32.6	41.5	26.0
Silver Star Rountain)) Can	0030	6/1	44	25.6	38.6	15.5
Summerland Reservoir	3A-Can	4200	5/11	18	8.1	3.0	2.3
January Zarra Rober v Jan	3 11		5/27	2	1.0	0.0	-
Trout Creek	3-Can	4700	5/12		5.4	4.4	1.7
Vaseux Creek	233-Can		5/14		0.0	0.8	0.5
White Rocks Mountain	70-Can		5/15		26.3	38.1	20.8
,			6/2	41	21.2	33.4	-
ENTIAT RIVER							
Blue Creek G. S.	20B28a		5/29	77	41.6	46.6	-
Entiat Meadows +	20A33a		5/29	68	36.7	46.6	-
Entiat River Trail +	20A34a		5/29	0	0.0	- /. /. /.	-
Four Mile Ridge +	20B27a		5/29	65	35.1	44.4	•
Fox Camp +	20A36a		5/29		76.7	84.4	•
Pope Ridge	20B20		5/29		0.0 32.9	- 51.6	_
Pugh Ridge +	20A32a		5/29 5/29		19.6		_
Shady Pass	20A37 20A35a		5/29		24.3	25.0	_
Snow Brushy +	20A35a 20B21a		5/29	12	6.5	15.5	-
Tommy Creek + # Average based on 19			3/29	1.4	0.5	-5.5	

Average based on 1958-72 average

Average for years of record *

Snow water equivalent estimated from aerial stadia observation.

SNOW DATA TO JUNE 1, 1975 - APPENDIX 4

SNOW			PAST R	RECORD			
DRAINAGE BASIN and/or SNOW	COURSE		Date	Snow Depth	Water Content	Water Content (inches)	
NAME	Number	Elevation	of Survey	(Inches)	· (Inches)	Last Year	Average #
CHELAN LAKE BASIN							
Little Meadows +	20A24a	5275	5/15	110	52.8	-	-
Lyman Lake Park Creek Ridge	20A23A 20A12A	5900 4600	5/15 5/15	150 97	72.0 46.6	-	-
WENATCHEE RIVER							
Stevens Pass	21B01	4070	5/15	121	56.7	77.2	48.3
Stevens Pass Sand Shed	21B45	3700	5/29 5/15 5/29	108 71 55	59.4 34.1 30.2	70.1 53.4 40.8	36.5 - -
YAKIMA RIVER							
Bumping Lake	21C08	3450	5/15 5/30	11 0	5.0 0.0	9.8	1.8
Bumping Lake New	21C3 6	3400	5/15 5/30	23	11.1	17.6	-
Stampede Pass SP	21B1 0	3860	5/14 6/2	-	47.1 41.2	68.6 70.4	33.6 18.8
Tunnel Avenue	21B08	2450	5/15 5/30	42 13	19.2	17.9 5.6	7.9
White Pass (E. Side)	21C28	4500	5/15 5/30	65 44	31.7 21.6	38.1 34.6	21.2 13.6
LOWE	R C O I	U M B		RAINA		3-10	13.0
COWLITZ RIVER							
White Pass (E. Side)	21C28	4500	5/15 5/30	65 44	31.7 21.6	38.1 34.6	21.2 13.6
P U G	ET S	OUNI	DRA				
GREEN RIVER							
Stampede Pass SP	21B10	3860	5/14 6/2	-	47.1 41.2		33.6 18.8
SKYKOMISH RIVER							
Stevens Pass	21B01	4070	5/15 5/29	121 108	56.7 59.4	7 7. 2 70.1	48.3 36.5
Stevens Pass Sand Shed	21845	3700	5/15 5/29	71 55	34.1 30.2	53.4	-

[#] Average based on 1958-72 average

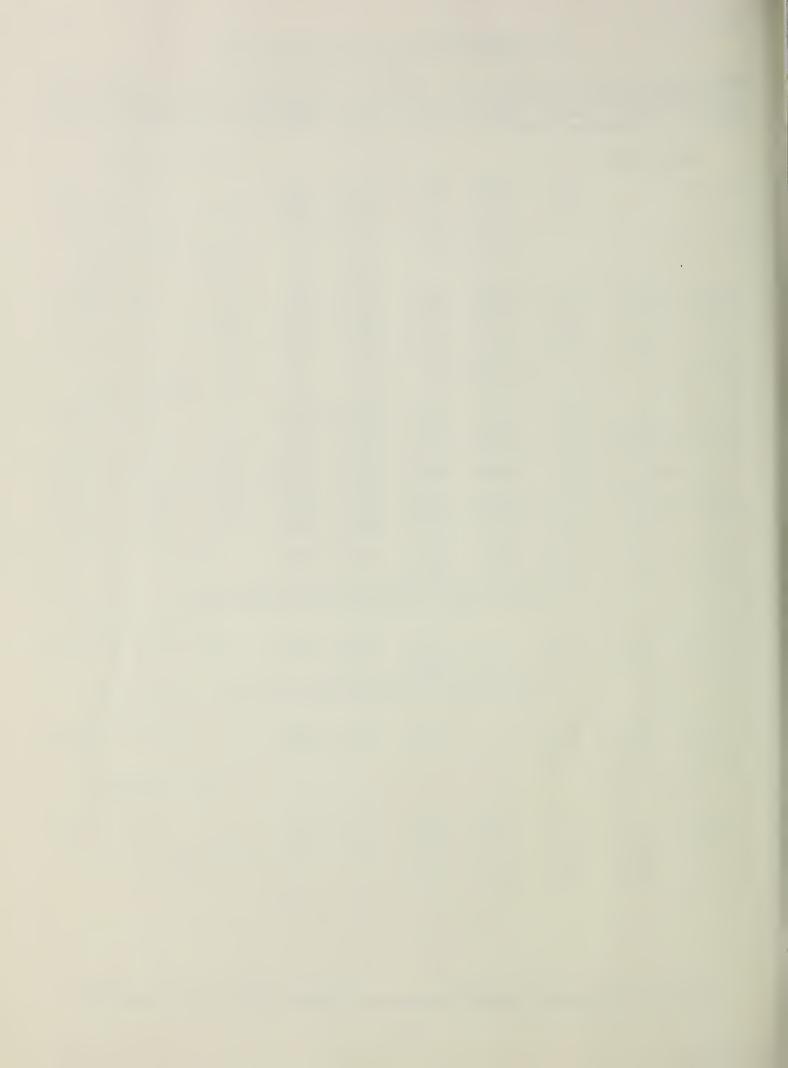
⁺ Snow water equivalent estimated from aerial stadia observation

SNOW DATA TO JUNE 1, 1975 - APPENDIX 5

Wons				THIS YEAR	Y	PAST R	ECORD
DRAINAGE BASIN and/or S	NOW COURSE		Date	Snow Depth	Water Content	Water Content (inches)	
NAME	Number	Elevation	of Survey	(inches)	. (Inches)	Last Year	Average tal
BAKER RIVER							
Baker Pass +	21A27a	4900	5/13	204	102.0	159.0	-
			5/27	186	102.0	-	-
Dock Butte	21A11A	3800	5/13	145	73.0	110.0	72.7
			5/27	134	74.0	~	58.0
Easy Pass	21A07A	5200	5/13	188	94.0	141.0	90.2
			5/27	170	93.0	-	73.6
Jasper Pass	21A06A	5400	5/13	206	103.0	155.0	114.7
•			5/27	210	115.0	-	84.2
Marten Lake	21A09A	3600	5/13	168	84.0	132.0	81.3
			5/27	152	84.0	**	66.2
Mount Blum +	21A18a	5800	5/13	172	86.0	116.0	-
			5/27	169	93.0		-
Rocky Creek	2 1 A12A	2100	5/13	53	27.0	31.0	12.1
			5/27	10	5.0	-	••
Schreibers Meadow	21A10A	3400	5/13	110	55.0	97.0	61.7
			5/27	112	62.0	-	48.6
S. F. Thunder Creek	21A14A	2200	5/13		Measured	0.0	0.0
			5/27	0	0.0	-	_
Watson Lakes	21A08A	4500	5/13	120	60.0	108.0	73.5
no coor have			5/27	144	79.0	-	61.4

[#] Average based on 1958-72 average

⁺ Snow water equivalent estimated from aerial stadia observation



Agencies Assisting with Snow Surveys

GOVERNMENT AGENCIES

Canada:

Department of Lands, Forests and Water Resources, Water Resources Service, British Columbia

States:

Washington State Department of Ecology Washington State Department of Natural Resources

Federal:

Department of the Army
Corps of Engineers

U. S. Department of Agriculture
Forest Service

U. S. Department of Commerce
NOAA, National Weather Service

U. S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service

PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company

OTHER PUBLIC AGENCIES

Okanogan Irrigation District Wenatchee Heights Irrigation District

MUNICIPALITIES

City of Tacoma City of Seattle

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

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"The Conservation of Water begins with the Snow Survey"